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A regional analysis of willingness-to-pay in Asian cruise markets

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Abstract
This article tests whether the willingness-to-pay (WTP) of cruise tourists is affected by multi-variables, namely regional level variables, socio-demographic variables, cruise perception variables, cruise motivations and cruise preferences. Our research aims to measure the influence of the multivariables on the WTP of cruise tourists, in order to trace the determinants of WTP. Using a censored regression model, the following variables are found to be highly associated with the WTP of cruise tourists: income, education, family structure, occupation, cruise experience, cruise duration and cruise preferences. The results of the modelling not only fill in existing research gaps in the theory of WTP but also shed new light on the comparison of multiple regions in terms of the difference of WTP of cruise tourists. A latent cluster analysis is further conducted to identify market segments with different cruise WTPs, and this knowledge can be used to improve the marketing performance of cruise companies in the growing Asian markets.

Keywords
Asian markets, cruise, willingness-to-pay

Introduction

Cruise tourism is on a rising edge in the past decades. The rapid rise of tourism was originally facilitated by train, by road and eventually by air, but in recent years, it has been boosted by the

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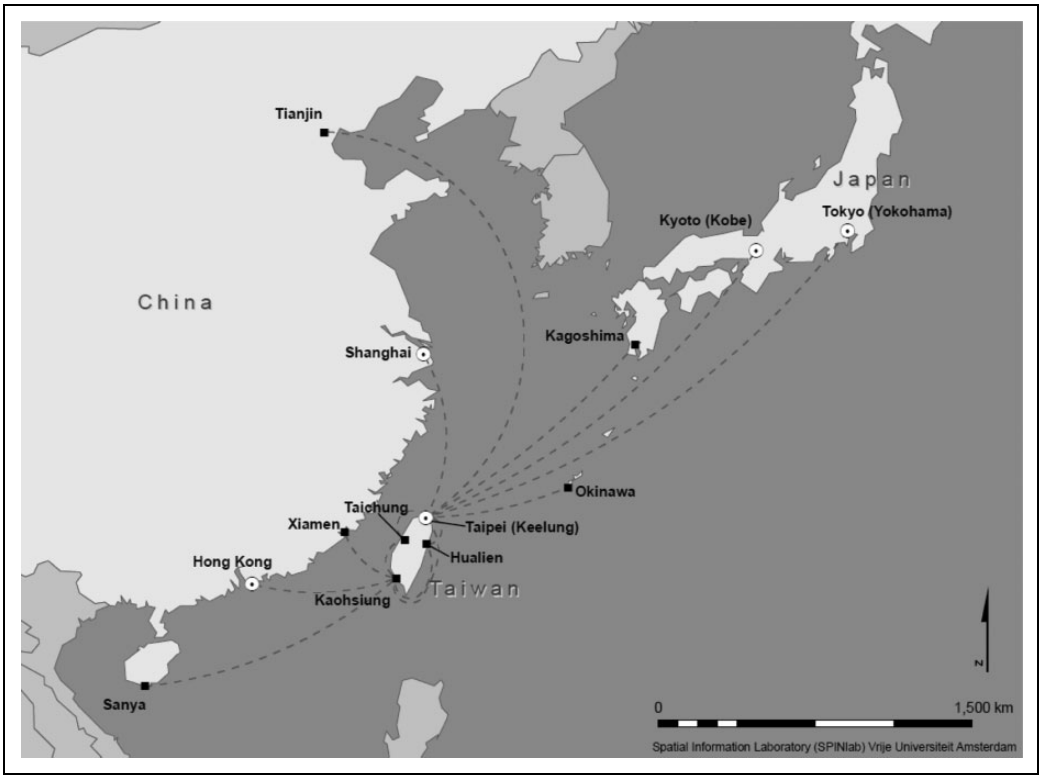

Figure 1. Main cruise ports in East Asia and cruise routes connected with Taiwan.

growth of cruise tourism. Cruise tourism has various particularities compared with other modes of tourism: (a) it is a chain movement along fixed trajectories, from port to port; (b) it is less complementary to other forms of tourism transport, and is dominated by a single transport mode, that is a cruise ship; (c) it is a form of mass tourism with thousands of passengers on one and the same ship, travelling on an all-inclusive basis (full board and lodging) and (d) on-board services on the cruise ship itself, while the ports visited offer alternative tourism services (shopping, historical visits, entertainment, etc.).

Modern cruising may be regarded as the fastest growing category in the leisure tourism industry which has had a significant annual growth rate of approximately 7.2% over the past three decades (FCCA, 2014). As a growing region, the Asian markets have great potential, and have already attracted the attention of the top world cruise companies. There has been a steady growth in passenger capacity reaching 2.17 million passengers; and 52 cruise ships were offering a total of 1065 separate cruise products in Asia in 2015. In the Asian cruise markets, short cruises are dominant: 80% of the cruises offered are for 2–6 nights, 12% for 7–13 nights and 8% for longer periods; and East Asia is the most active region with 20.5% annual growth, accounting for over half (51%) of the Asian markets as a whole (CLIA, 2014; Figure 1). In contrast to the global markets, potential cruise tourists seek cruises of around 7.5 days in duration and a reasonable price range of US$170–230 per cabin per day; for an entire cruise, their total amount of willingness-to-pay (WTP) is on average US$1700 for standard cabins, US$2100 for premium (mid-priced) cabins,

US$2800 for luxury cabins and US$3,200 per person for the consumption in port destinations (FCCA, 2013).

Comparing with the accelerating growth in cruise industry, the academic field is relatively plateauing out somehow. Although consumption behaviours of cruise tourists has received attention (Brida et al., 2014; Lee and Yoo, 2015), little is known about the determinants of cruise WTP and the differences of cruise WTP in different market segments. No prior studies have considered explicitly these perspectives. With respect to the great potential of the Asian cruise markets, our research focusses on two questions: (a) How do the multivariables, namely regions, socio-demographics, cruise perception, cruise motivation and cruise preferences, influence the WTP of cruise tourists in the Asian markets? and (b) How can the Asian cruise markets be clustered, and the most valuable segments be identified? This study offers the first empirical investigation of the cruise WTP and further explores the WTP differences among different regions.

Theory background

This section aims to sketch out some fundamentals of cruise tourism. From the starting point of industrial organization theory, firms must know the demand function, in order to maximize their profits. For market operation, WTP is a widely accepted estimator for the demand of consumers and also a meaningful reference value for firms making an optimal pricing decision (Kohli and Mahajan, 1991). In this research, we concentrate on the operational quantitative analysis of WTP and its related variables.

Most past studies have focussed on income, which significantly influences WTP (Govindasamy and Italia, 1998). Apart from income, some other socio-demographic variables affect consumers' WTP. For instance, education influences the WTP for solid waste management in India (Hazra et al., 2015); nationalities (both domestic visitors and foreigners) affect the WTP for marine-based tourism in Thailand (Piriyapada and Wang, 2015) and Mozambique (Daly et al., 2015); and guests in luxury, mid-priced or economy hotels have various WTPs for the hotels' green practices in the United States (Kang et al., 2012).

Some variables related to the perception of tourism are linked to WTP, such as the duration of stay and the depth of experience of ecotourism (Choi et al., 2015; Mejia and Brandt, 2015), and perceived values of first and repeat cruise tourists influence their WTP (Chang et al., 2013; Petrick, 2004) and so on. In addition, tourists' motivation and preference are identified to influence WTP in many studies, as follows: geographic distance effects (Pate and Loomis, 1997); attitude, intention and motivation (Hultman et al., 2015); emotional or psychological determinants (Lee et al., 2013); service quality and loyalty (Dean et al., 2002); satisfaction and attached value of conserving heritage (Kim et al., 2007; Yung and Chan, 2015); luxury amenities in the hotel room (Heo and Hyun, 2015) and perceived brand globalness (Davvetas et al., 2015).

In the techniques, the interval data of WTP could be more robust, and interval regression models are superior to the bivariate model (Alberini, 1995). Hensher and Sullivan (2003) found that stated preference data are more effective than revealed preference data in empirical modelling. Hole (2007) discussed and further tested the approaches of estimating confidence intervals for WTP. Lee and Yoo (2015) used the choice experiment approach to research the marginal WTP for increasing the attributes of cruise facilities (e.g. cruise duration, accommodation, services and cost) and found that the marginal WTP is substantially more influenced by cruise on-board facilities rather than by port visits. Similarly, in the research of Masiero et al. (2015), a stated choice

experiment and discrete choice modelling method were used to obtain the guests' WTP for hotel attributes (including room views, hotel floor, club access, free mini-bar items, smartphone service and cancellation policy), and it was found that various segments of travellers (e.g. leisure or business travellers, first time or repeat, etc.) have different WTPs.

The aforementioned literature review reflects that extant research in cruise economics is still very deficient and lacks depth from an academic perspective. We found various studies in the general field of tourism consumption, but there is hardly any discussion about the WTP of cruise tourists. For cruise tourism, cruise lines are operated around some particular cruise ports, while cruise tourists are from different regions. This requires efficient marketing strategies to be developed under the segmentation of regional markets. So, our study zooms in on WTP of tourists for a cruise product in the short term (3 years in our research), in order to be consistent with the official cruise industry reports of FCCA (2012, 2013). We use a censored regression to analyse the correlated multivariables of cruise WTP, and apply a further latent cluster analysis (LCA) to identify the valuable segments in the Asian markets to provide some knowledge on cruise lines' marketing performance.

Research design

On the basis of some previous theoretical studies of cruise motivation (Hung and Petrick, 2011) and cruise preference (Xie et al., 2012), we did some field research by face-to-face interviewing several cruise experts from some leading cruise operators, namely Costa, Royal Caribbean, Star Cruise, Cosco, Princess and some related tour operators. So, we achieved to find that the main Asian cruise tourists' resource regions are Mainland China, Hong Kong, Taiwan and Japan, while Taiwan is a strategic geographical destination in Asian cruise lines.

On the basis of our literature review and field research, a trial questionnaire was designed and tested using 123 samples. Finally, our final cross-section survey was further revised and conducted in four cruise ports, namely Keelung, Taichung, Kaohsiung and Hualien (all in Taiwan), from 8 May to 22 May 2014. We distributed 800 surveys to the tourists from Japan, Mainland China, Hong Kong, Taiwan and other global regions; 575 completed questionnaires (i.e. a valid response rate of 72%) were used in our research.

Table 1 summarizes cruise tourists' socio-demographic characteristics in the Asian markets. Cruise tourists in the Asian markets have certain characteristics: (a) nearly half (48.53%) are younger than 40; (b) over half (58.96%) are without cruise experience or are cruising for the first time; (c) the majority (61.22%) have a monthly income of US$2000 or below; (d) as much as 60.35% have a higher level of education (a Bachelor's degree or above); (e) more than three quarters (82.26%) prefer to travel with friends or family; (f) in terms of marital status, over one-third are single (38.96%), and just under one-third are married with adult children (32.00%); (g) their main occupation is company staff (20.17%) and (h) as much as 58.61% are (strongly) willing to cruise, and half of them (50.44%) are willing to pay US$1000 or below in near future (3 years in our survey). An intuitive understanding can be gained from the above descriptions, that is, the surveyed individuals are mainly young, and have a lower income, a higher education level, a strong cruise intention (willingness to cruise) and a moderate WTP. Although the latter could be related to the respondents' generally lower income level, another possible explanation might be that Asian people have hardly changed their ingrained consumption attitudes, such as the traditional thrifty idea of 'saving money for a rainy day'.

Table 1. Cruise tourists' characteristics in the Asian markets.

	Percentage		Percentage
Region		Family status	
Mainland China	22.26	Single	38.96
Hong Kong	12.00	Married, no child	13.39
Taiwan	26.09	Married, with underage children	15.65
Japan	24.00	Married, with adult children	32.00
Other	15.65	Cruise experience	
Gender		Never	38.61
Male	50.61	First time	20.35
Female	49.39	Second time	13.91
Age		Third time and above	27.13
18–29	32.35	Cruise intention	
30–39	16.18	Strongly unwilling	5.91
40–49	14.26	Unwilling	7.48
50–59	13.04	Uncertain	28.00
60–69	13.91	Willing	28.35
≥70	10.26	Strongly willing	30.26
Education		Preferred partner	
High school and below	21.91	Alone	5.74
Vocational school	17.74	With tour group	5.39
Bachelor's degree	37.04	With families/friends	82.26
Graduate and above	23.31	With colleagues	4.35
Monthly income		With others	2.26
≤US$1000	36.35	Cruise duration	
US$1001–2000	24.87	2 days and below	5.04
US$2001–4000	21.22	2–5 days	32.35
US$4001–8000	10.78	6–9 days	33.22
≥US$8001	6.78	10–14 days	20.00
Occupation		15 days and above	9.39
Student	16.35	Willing to pay	
Company staff	20.17	≤US$500	15.48
Business owner/manager	8.87	US$501–1000	34.96
Liberal profession	10.96	US$1001–1500	22.43
Government employee	10.78	US$1501–2000	15.65
Retired	17.04	≥US$2001	11.48
Other (mainly housewives)	15.83		

Measurement

In our research, cruise WTP is represented by a set of interval consistent estimators, such as US$0–500, US$501–1000, US$1001–1500, US$1501–2000 and above US$2001. There are 13 variables correlated to cruise WTP, namely region, gender, age, education, monthly income, occupation, family structure cruise experience, cruise intention, preferred partner, cruise duration, cruise motivation and cruise preference. According to the previous research of Kim et al. (2007) and Ezebilo et al. (2015), they found that a set of variables, namely distance away from home (regional variable), socio-demographics (such as age, gender, education, income, occupation,

family structure), consumption experience/frequency, duration, motivation, preference and intention, influence WTP significantly. So, we divided the independent variables as follows: regional variable (Mainland China, Hong Kong, Taiwan, Japan and other global regions), socio-demographics (age, gender, education, income, occupation and family status), cruise perception (cruise experience, cruise intention, cruise partner and cruise duration), cruise motivation and cruise preference.

As motivations and preferences are both linked to WTP research (Heo and Hyun, 2015; Hultman et al., 2015), we decided to include these two variables in our further modelling. Considering the significant growth of cruise tourism in Asia, it has attracted a large number of cruise tourists with diverse motivations (Hung and Petrick, 2011) and preferences (Xie et al., 2012). It is worth to note that Chen et al. (2016) have applied principal components analysis (PCA) to explore the components of cruise motivations and cruise preferences in the Asian markets. With regard to their results of the confirmatory factor analysis (CFA) on the various constructs of the two variables, there is sufficient evidence of internal consistency (Cronbach's $\alpha > 0.6$), convergent validity (AVE > 0.5) and composite reliability (CR > 0.7) of all the constructs. So, the results of cruise motivation and preference tested through PCA and CFA by Chen et al. (2016) are used as two independent variables in our research: We refer cruise motivation to four constructs, namely self-esteem (increasing self-worth, impressing others, deriving accomplishment), escaping (escaping from routines, being free, mental relaxation), learning (gaining knowledge, enjoying a thrill, experience of other cultures) and bonding (joining friends/family, interacting with friends/family); and cruise preference refers to seven constructs, including basic facilities (restaurants, cabin facilities, room service, food), entertainment (night club, casino, social gathering/party), sports provision (running track, sports area, climbing wall, miniature golf), recreation possibilities (spa, beauty salon, swimming pool/hot tubs, fitness), children facilities (babysitting service, children centre), ports (consumption level, natural landscapes, cultural landscapes, city landscapes, tour options, infrastructure, friendly residents) and a particular Asian features (teahouse).

Censored regression modelling

We use censored models to measure the effects of independent variables on WTP, since this type of interval regression is more accurate. All the 13 independent variables listed at the beginning of this section are included in our censored regression model, in order to identify the precise value of the WTP for a change of one unit of each variable. We then obtain our model:

$$\mathrm{WTP} = \alpha + \beta_i \mathrm{Reg}_i + \gamma_j \mathrm{Soc}_j + \delta_k \mathrm{Per}_k + \eta_l \mathrm{Mot}_l + \theta_m \mathrm{Pre}_m + \varepsilon \ ,$$

where WTP is the dependent variable; Reg_i denotes Mainland China, Hong Kong, Taiwan, Japan and other global regions; Soc_j denotes age, gender, education, income, occupation and family status; Per_k denotes cruise experience, cruise intention, cruise partner and cruise duration; Mot_l denotes self-esteem, escaping, learning and bonding and Pre_m denotes on-board basic facilities, entertainment, recreation, sports, children facilities, ports and Asian features.

Our research focusses in particular on how the variables regions, socio-demographics, cruise perception, cruise motivation and cruise preferences influence the WTP. In order to measure the effects of these multivariables on WTP, we applied censored regression models in our analyses and divided the independent variables into five categories as follows: regional variables, socio-demographic variables, cruise perception variables, cruise motivation and cruise preferences.

Table 2 shows the results of the censored regression model for all the variables' effects on cruise WTP. For the multinomial variable of cruise regions, compared with the reference category of Hong Kong cruise tourists, one Japanese cruise tourist is willing to pay US$345.73 more and one Taiwanese cruise tourist US$198.28 more. Conversely, the cruise tourist from Mainland China and other global regions pays only moderately more than the one from Hong Kong, respectively, US$95.32 and US$53.59. So, it is obvious that Japanese cruise tourists have a significantly higher WTP, and this market deserves further research.

For the socio-demographic variables, it is interesting that age generally has a U-shaped effect on cruise WTP. Compared with the specific age range of 40–49, the youngest age range (18–29) is willing to pay US$171.37 more, but the most senior people ($\geq$70) are only willing to pay US$38.85 more, though not significantly. Compared with the reference category 'male cruise tourist', each female cruise tourist is willing to pay US$27.30 more. An increase of education influences cruise WTP positively, and it is worth noting that cruise tourists with a Master's degree or above are willing to pay US$160.59 more than the reference category 'high school and below'. Compared with the income reference category of less than US$1,000, an increase of income range influences cruise WTP significantly: Cruise WTP will grow by US$190.13 when the monthly income range rises to US$1000–2000, and by US$611.10 when income rises to US$8000. Compared with the reference category government employee in the occupation variable, senior retired people, housewives and business managers/owners are willing to pay more, respectively, US$259.08, US$241.04 and US$206.40, though most of the company staff would pay only US$105.29 more. Compared with a tourist who is 'married with underage children', a tourist 'married with adult children' is willing to pay US$180.36 more, followed by US$145.89 more from a tourist 'married without children' and US$88.33 more from a single person. So, increases of both education and income contribute to cruise WTP significantly. It is obvious that a tourist who is 'female', '18–39 years old', married with adult children, or a 'retired/housewife/business owner or manager' has a higher WTP, which means that the categories of cruise tourists having sufficient disposable income and travel time are willing to pay more. It is worthy to note that housewife is a widely existing occupation in Asia and they usually have a sufficient travel budget because of a comparatively higher income from the male side, though housewife does not earn a wage added to household income (Kwak et al., 1997).

For the variables of cruise perception, both past cruise experience and cruise intention in the future have a positive effect on WTP, with added amounts of, respectively, US$82.37 and US$57.18, compared with no cruise experience in the past or being unwilling to cruise in the near future. Compared with the reference category 'cruise duration of 2 days and below', with an increase of cruise duration, there is a positive effect of an inverted U shape on WTP, while the highest added amount of US$751.25 applies to the cruise duration of 10–14 days. For the variable cruise partner, compared with the reference category 'with colleagues', interestingly we found that 'with tour group' adds the lowest amount of only US$34.35 to the WTP, which might be in conflict with a cruise companies' marketing strategy, as 70% of the tickets are distributed by tour agents (CLIA, 2015). In addition, cruise tourists travelling 'with families/friends' add a moderate amount of US$132.34 to their WTP, but those travelling 'alone' add an even higher amount of US$139.31, which is not consistent with the traditional collective culture in Asia. So, the optimal strategy of cruise companies should be to focus on repeat cruise tourists with an intention to take a cruise in the short term (3 years), to promote the cruise duration of 10–14 days and to target groups of 'families/friends' or individuals travelling alone.

Table 2. Results of censored regression models of cruise WTP.

Multivariables			Coefficient	Standard error	z Value	Pr>|z|
Cruise region		Hong Kong	0.00			
		Mainland China	95.32	85.54	1.11	0.265
		Taiwan	198.28*	83.72	2.37	0.018
		Japan	345.73***	91.86	3.76	0.000
		Other	53.59	85.43	0.63	0.530
Socio-demographics	Age	18–29	171.37	92.43	1.85	0.064
		30–39	108.14	82.66	1.31	0.191
		40–49	0.00			
		50–59	97.29	85.17	1.14	0.253
		60–69	52.87	100.13	0.53	0.597
		≥70	38.85	112.23	0.35	0.729
	Gender	Male	0.00			
		Female	27.30	46.15	0.59	0.554
	Education	High school and below	0.00			
		Vocational school	40.63	67.86	0.60	0.549
		Bachelor degree	91.31	59.55	1.53	0.125
		Master degree and above	160.59*	70.08	2.29	0.022
	Monthly income	≤US$1000	0.00			
		US$1001–2000	190.13**	60.84	3.12	0.002
		US$2001–4000	253.89***	70.22	3.62	0.000
		US$4001–8000	405.67***	86.44	4.69	0.000
		≥US$8001	611.10***	103.27	5.92	0.000
	Occupation	Government employee	0.00			
		Liberal profession	4.58	90.45	0.05	0.960
		Staff	105.29	80.15	1.31	0.189
		Student	110.98	102.19	1.09	0.277
		Business owner and manager	206.40*	99.30	2.08	0.038
		Other (mainly housewives)	241.04**	85.68	2.81	0.005
		Retired	259.08**	92.56	2.80	0.005
	Family status	Married with underage children	0.00			
		Single	88.33	79.02	1.12	0.264
		Married without children	145.89	79.90	1.83	0.068
		Married with adult children	180.36*	79.56	2.27	0.023
Cruise perception	Experience	None	0.00			
		≥1	82.37	52.25	1.58	0.115
	Intention	Unwilling to cruise in 3 years	0.00			
		Willing to cruise in 3 years	57.18	67.99	0.84	0.400
	Duration	2 days and below	0.00			
		2–5 days	298.32**	99.59	3.00	0.003
		6–9 days	569.83***	99.61	5.72	0.000
		10–14 days	751.25***	111.89	6.71	0.000
		15 days and above	716.79***	116.27	6.16	0.000

(continued)

Table 2. (continued)

Multivariables			Coefficient	Standard error	z Value	Pr>|z|
	Partner	With colleagues	0.00			
		With tour group	34.35	134.77	0.25	0.799
		With families/friends	132.34	104.09	1.27	0.204
		Alone	139.31	131.85	1.06	0.291
		With others	151.50	172.42	0.88	0.380
Cruise motivation		Learning	−9.97	62.41	−0.16	0.873
		Self-esteem	2.51	36.33	0.07	0.945
		Escaping	53.54	59.84	0.89	0.371
		Bonding	55.93	46.08	1.21	0.225
Cruise preference		Recreation	−86.70*	40.95	−2.12	0.034
		Children facilities	−37.63	27.79	−1.35	0.176
		Sports	−6.36	46.98	−0.14	0.892
		Ports	21.15	35.20	0.60	0.548
		Asian features	22.48	52.23	0.43	0.667
		Entertainment	50.24	33.63	1.49	0.135
		Basic facilities	89.19*	41.05	2.17	0.030
Interval observations = 575		Log-likelihood = −760.01	χ^2 (47) = 325.85		Prob > χ^2 = 0.000	

Note: WIP: willingness-to-pay.
*$p < 0.05$.
**$p < 0.01$.
***$p < 0.001$.

In cruise motivation, the 'bonding' and 'escaping' tourists add the highest amounts to their WTP, respectively, US$55.93 and US$53.54. These two motives correspond to the two high amounts given to cruise partners with families/friends and alone, respectively, US$132.34 and US$139.31. As expected, an increase of one unit of 'learning' will decrease the amount of cruise WTP by US$9.97, and 'self-esteem' can only slightly influence WTP positively with an amount of US$2.51.

In cruise preferences, we notice that 'basic' and 'entertainment' facilities have high positive statistical results for increasing WTP, respectively, US$89.19 and US$50.24. The 'Asian features' and 'ports' facilities both add similar moderate amounts to increase cruise WTP, respectively, US$22.48 and US$21.15. However, if cruise tourists' preference for 'recreation' facilities increases, this will decrease their WTP significantly (−US$86.70), followed by negative effects of 'children' (−US$37.63) and 'sports' facilities (−US$6.36), though not significantly.

That is to say, Japan is the country with the highest positive effect on an individual's WTP, followed by Taiwan, which is also confirmed in the previous research (Chen et al., 2016). In general, a high cruise WTP is significantly correlated with a high level of education, income and cruise duration. In addition, some variables will also contribute to an increase of cruise WTP, such as female, retired people, housewives, business managers and owners, married with adult children or without children, repeat cruise tourists, strong cruise intention, cruising alone or with families/friends, cruise motivation of escaping or bonding, with cruise preference for on-board basic facilities, entertainment, ports and Asian features.

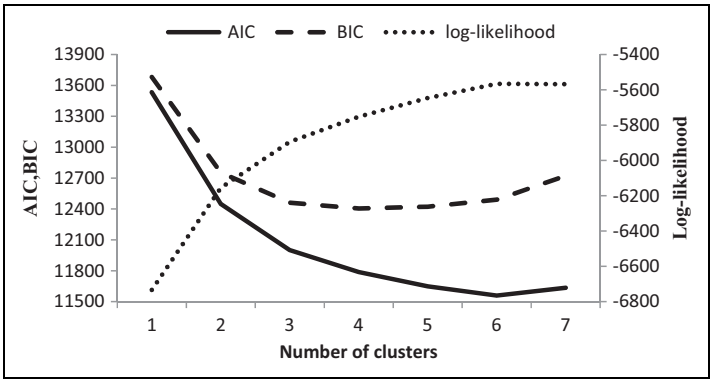

Figure 2. BIC, AIC and log-likelihood for the different numbers of clusters identified. BIC: the Bayesian information criterion; AIC: Akaike information criterion.

Latent cluster analysis

On the basis of the results of the censored regression models, we have undertaken a further market analysis, in order to find the most valuable segments. The approach we used in our research was LCA, which was undertaken using the software package poLCA in the R 3.2.2 program. LCA is a reliable modelling approach, which identifies the optimal number of clusters using the statistics of the Akaike information criterion (AIC), the Bayesian information criterion (BIC) and the log-likelihood (Akaike, 1973; Schwartz, 1978). The model fits best using the small values of both the AIC and the BIC, and the large value of the log-likelihood. According to the suggestion of Lin and Dayton (1997), the number of clusters given by the smallest value of the AIC should be considered first in the context of small samples (less than 1000). Figure 2 shows the optimal number of clusters, and six classes were identified.

In order to not over fit the LCA model, some of the non-significant variables in the censored regression models were not included, namely gender, cruise intention, cruise partner and cruise motivation. Since age and cruise experience are both vital factors in the previous research (Chen et al., 2016), they are remained for further clustering, though non-significant. In our LCA model, we focus on nine variables: regions, age, income, education, family structure, occupation, cruise experience, cruise duration and cruise preferences. Based on the AIC, BIC and log-likelihood statistics, Table 3 shows the class membership probabilities in a six-class covariate model.

Classes 1 and 2 hold a small share of the total markets of, respectively, 11.3% and 9.7%. Class 1 has the following characteristics: 100% of the cruise tourists are young single people (18–39 years), who prefer short cruises of 2–5 days; 98.4% of these young people have a low income (less than $2000/month); 88.2% are students or company staff; nearly half (48.2%) of them have a higher education level; more than half (62.7%) have no cruise experience and recreation is their most preferred facility, followed by basic facilities. From the high-level regional view in class 1, most of the people (36.9%) are from Mainland China and the least (4.6%) are from Japan. Compared with class 1, the population of class 2 is characterized by senior citizens, with only 5.1% young people and less than half of them (44.1%) are single. But 75.0% of the people in class 2 have a low level of education; 62.1% have a monthly income of less than US$2000; 61.0% have a liberal profession, or are retired, or are housewives with cruise time flexibility. In addition, a majority

Table 3. Latent class probabilities of the covariate model ($n = 6$).

Manifest variables	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6
Latent class probabilities	0.113	0.097	0.164	0.153	0.179	0.294
Cruise region						
– Mainland China	0.369	0.232	0.255	0.398	0.155	0.095
– Hong Kong	0.077	0.286	0.107	0.046	0.214	0.071
– Taiwan	0.292	0.286	0.415	0.386	0.204	0.124
– Japan	0.046	0.107	0.053	0.068	0.252	0.544
– Other	0.216	0.089	0.170	0.102	0.175	0.166
Socio-demographics						
Age						
– 18–39 years	1.000	0.051	0.773	1.000	0.081	0.266
– 40–59 years	0.000	0.619	0.216	0.000	0.603	0.225
– 60 years and above	0.000	0.330	0.011	0.000	0.316	0.509
Monthly income						
– US$2000 and below	0.984	0.621	0.668	0.846	0.410	0.444
– US$2001–US$4000	0.000	0.255	0.163	0.109	0.293	0.308
– US$4000 and above	0.016	0.124	0.169	0.045	0.297	0.248
Education						
– Vocational school and below	0.194	0.750	0.325	0.321	0.452	0.396
– Bachelor's degree	0.324	0.224	0.399	0.338	0.371	0.438
– Graduate and above	0.482	0.026	0.276	0.341	0.177	0.166
Family structure						
– Single	1.000	0.020	0.441	0.778	0.093	0.243
– Married, without/with adult children	0.000	0.835	0.212	0.126	0.700	0.645
– Married, with under aged children	0.000	0.145	0.347	0.096	0.207	0.112
Occupation						
– Student/staff	0.882	0.157	0.468	0.702	0.108	0.172
– Manager/government employee	0.069	0.233	0.258	0.071	0.334	0.183
– Liberal profession/retired/housewife	0.049	0.610	0.274	0.227	0.568	0.645
Cruise perception						
Cruise experience						
– No cruise experience	0.627	0.259	0.482	0.624	0.268	0.237
– Cruised once before	0.171	0.305	0.176	0.192	0.281	0.154
– Cruised two times or more before	0.202	0.436	0.342	0.184	0.451	0.609
Cruise duration						
– 2–5 days	1.000	1.000	1.000	0.000	0.000	0.000
– 6–14 days	0.000	0.000	0.000	1.000	1.000	0.681
– 15 days and above	0.000	0.000	0.000	0.000	0.000	0.319
Cruise preference						
– Basic facilities	0.362	0.406	0.316	0.343	0.616	0.568
– Entertainment	0.053	0.086	0.060	0.069	0.048	0.053
– Recreation	0.472	0.361	0.471	0.510	0.219	0.296
– Children facilities	0.034	0.076	0.090	0.044	0.050	0.030
– Ports	0.032	0.000	0.000	0.012	0.019	0.012
– Asian features	0.047	0.071	0.063	0.022	0.048	0.041

Table 4. Results of an ANOVA of the differences in WTP between the six classes.

	Class 1		Class 2		Class 3		Class 4		Class 5	
	M.D.	*p* Value	M.D.	*p* Value	M.D.	*p* Value	M.D.	*p* Value	M.D.	*p* Value
Class 2	16	1.000								
Class 3	−5	1.000	−21	1.000						
Class 4	569*	0.000	554*	0.000	574*	0.000				
Class 5	569*	0.000	554*	0.000	574*	0.000	0	1.000		
Class 6	1149*	0.000	1133*	0.000	1154*	0.000	580*	0.000	580*	0.000

Note: M.D.: mean difference (row mean − column mean); WIP: willingness-to-pay; ANOVA: analysis of variance.
*$p < 0.05$.

(83.5%) of the people in this category are married with adult children or without children; and 74.1% of them have cruised at least once, and their most preferred facilities are basic and recreation. In class 2, Hong Kong and Taiwan have the same share of 28.6%, followed by Mainland China (23.2%), Japan (10.7%) and other parts of the world (8.9%).

Classes 3 and 4 have a similar market share of, respectively, 16.4% and 15.3% and have a majority of young people, with a low income, an average level of education, the occupation of student or company staff, single status and a similar preference for basic and recreation facilities. Nearly half (48.2%) of these people are without cruise experience, and in class 3 all like to take short cruises of 2–5 days, but over half (62.4%) the people in class 4 have no cruise experience, with 100% preference for cruises of 6–14 days. In class 3, Taiwan has 41.5% of the regional share, and in class 4, Mainland China leads with 39.8%.

Class 5 (17.9%) and class 6 (19.4%) are the two biggest segments, and both have a majority of people with a higher income, a higher level of education, and who are married with adult children or without children. They have cruise time flexibility, at least one cruise experience, and prefer longer cruises and basic facilities. The big difference between the two segments is that in class 5 more than half (60.3%), the people are 40–59 years old; but in class 6, nearly 50.9% of the people are much more senior (over 60 years old). In class 5, Japan has a regional share of 25.2%, but in class 6 it has as much as 54.4%.

In order to find some commonalities between the six classes, we applied a one-way analysis of variance (ANOVA) to identify the differences of WTP. We used Levene's test to check the homogeneity of variance between the segments and found significant deviation of variances (0.000). So we then applied the Welch ANOVA and the Tamhane's T2 post hoc test.

Table 4 shows that classes 1, 2 and 3 have no significant difference in WTP, and the same is the case for classes 4 and 5. The former three classes have a similar low WTP, and the latter two classes have a comparatively higher WTP. Class 6 has the highest WTP, significantly different from that in any of the other classes.

On the basis of the results of classes, we further analysed the correlations between the six classes and the WTP of individuals to identify the most valuable segments. For a better understanding of marketing strategies, we used the BCG Growth-Share matrix to identify the segments in Table 5 as follows: class 1 (young 'question marks'), class 2 (middle-aged 'dogs'), class 3 (young 'dogs'), class 4 (young 'stars'), class 5 (middle-aged 'stars') and class 6 (senior 'cash cows'). It is obvious that cruise companies should maximize the profits from senior 'cash cows'

Table 5. Cross tabulation of classes and WTP.

Class	WTP (in US$)					In all
	0–500	501–1000	1001–1500	1501–2000	≥2001	
1 (young 'question marks')	20	32	9	4	0	65
2 (middle-aged 'dogs')	15	30	7	3	1	56
3 (young 'dogs')	28	45	12	6	3	94
4 (young 'stars')	9	39	30	8	2	88
5 (middle-aged 'stars')	6	35	25	20	17	103
6 (senior 'cash cows')	11	20	46	49	43	169

Note: WIP: willingness-to-pay.

(class 6), who are the majority of the regional share of Japanese retired and repeat tourists. Cruise companies should pay more attention to the preferences of this segment, such as those for cruise duration of 6–14 days, and basic facilities. In contrast to the senior citizens of class 6, class 4 is a young category without cruise experience, and class 5 is a middle-aged experienced group, but both of them have the same preferences as class 6. Cruise companies might also focus on class 2, a middle-aged experienced segment, and on class 3, a young group without cruise experience, both of them with a comparatively lower WTP, a lower income and preferred shorter cruises of 2–5 days. For the young question marks segment of class 1, mainly young, single and inexperienced tourists with a low income but a higher education level, the results of the censored regression models show that education is a positive variable for WTP, so cruise companies should explore this potential category by optimizing their market strategy and designing shorter cruises of 2–5 days.

Discussion and conclusion

Our study has contributed to the theoretical and methodological research in the cruise tourism field: First, we introduced a general censored regression model to cruise WTP, which could enrich the theoretical research on the theory of WTP, while this is also the first article to build a WTP model in the context of cruise tourism; second, we undertook a LCA to expand our research to regional cruise markets, which might provide a new approach in marketing research in a broad regional perspective. In addition, this article is based on a cross-section survey in the context of multiregional respondents, and the results of our research could be applied in cruise marketing practice, especially for the case of the growing Asian cruise markets.

In our research, interval regression was applied to measure the effects of multivariables, namely regions, socio-demographic variables, cruise perception variables, cruise motivation and cruise preferences. Different regions are taken as the high-level variables, namely Mainland China, Hong Kong, Taiwan, Japan and other global regions. In the censored regression model, Japan is the market with the highest WTP, followed by Taiwan, Mainland China, Hong Kong, while other global regions have a lower WTP, especially Hong Kong which has the lowest WTP, which might be interpreted by the cruise lines' competition and comparatively lower attached social value of cruise products in Hong Kong (Yung and Chan, 2015). The variables such as income, education, cruise experience and cruise duration have significantly positive effects on WTP. However, there are no significant regional differences in the effect of age on the WTP of cruise tourists. In contrast

to the multinomial variables of family structure and occupation, the effect of families with underage children is significantly negative, and the tourists with cruise time flexibility (e.g. business owners or managers, the retired or housewives) are positively related to WTP. In terms of cruise preferences, basic facilities are the most preferred in relation to WTP, followed by entertainment, Asian teahouse and ports facilities, though non-significantly, showing a trend of ship-based destination in cruise tourism. It should be noted that recreation facilities decrease the cruise tourists' WTP significantly, which might be explained from the fact that some recreational facilities, like spa and beauty salon, are paid service and these facilities somehow challenge the parsimonious habit of Asian tourists in tourism consumption (Zhang and Lin, 2013).

On the basis of the results of the analysis of the multivariables in the censored regression models, we further used the LCA approach to determine market segmentation. Moreover, an ANOVA and the BCG Growth-Share matrix were used to identify the most valuable segments. Clearly, some knowledge of our findings can be applied in cruise marketing practice. The related cruise operators in the Asian markets might find it profitable to pay attention to the potential cruise tourists with a high WTP such as tourists with cruise experience in the past and cruise intention in the near future, people with a high income and a higher education level, couples with adult children or without child, retired senior citizens and housewives with cruise time flexibility, business owners and managers, and tourists with a preference for a medium cruise duration of 6–14 days and basic facilities.

Our study has focussed on cruise tourists' short-term WTP over the next 3 years consistent with the official cruise industry report, that is, FCCA (2012, 2013); clearly, a general research expanding to lifetime value would fill in the research gap in tourism field. In the future, a longitudinal time series might be further applied to track the trend of cruise markets in regional development. In addition, there is also considerable scope to extend this study to the global cruise markets as well as to develop appropriate related regional economic growth theories.

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